Appendix A

ABSTRACT

This invention provides an alternative source of *ahas* and *pds* nucleic acids for plant transformation and selection. In particular, the invention provides ahas and pds nucleic acids from cyanobacteria, for example, *Synechocystis*, and expression elements of these genes for control of expression in plastids. The invention further provides nucleic acids encoding the acetolactate synthase (*ahas*) large subunit and the *ahas* small subunit which were found to provide herbicide resistance to plants. The present invention also provides a novel *Synechocystis* mutant phytoene desaturase (*PDS*) gene conferring resistance to 4'-fluoro-6-[(alpha, alpha, alpha,-trfluoro-m-tolyl)oxy]-picolinamide, a bleaching herbicide. The present invention provides improved methods involving cyanobacteria for the screening of compounds, including a new high throughput protocol that is a rapid and cost effective way to identify target site genes.